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Studies on looseness of cod fillets

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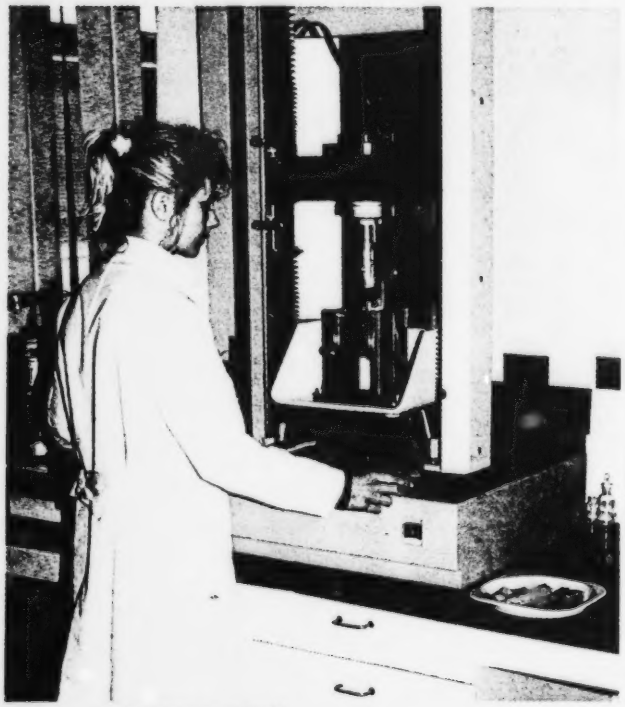
STUDIES ON LOOSENESS OF COD FILLETS



Rifpol mælt í Instron-mælitæki.

Tear resistance measured in Instron instrument.

Looseness of fish fillets is a known phenomenon in many countries. In Iceland, looseness and cracks are a very common problem in cod fillets, and haddock fillets are also often loose. It is commonly said among fishermen and fish processing people that "summer fish" is loose, although it is not possible to explain what this means exactly.

Important studies on looseness in cod were carried out in the Icelandic Fisheries Laboratories just over a decade ago. It was discovered that fish having a lot of feed appeared to be looser than other fish. In 1987, studies on the subject were reinstituted and developed further, and a Canadian scientist from St. John's, Newfoundland, worked then in the laboratories for one year.

The objective of this research was to study the principal reasons of looseness and also whether quick chilling would reduce it.

The study method was to go out eleven times at two-week intervals in dragnet boats or trawlers to take samples of cod in the southwest. Living and struggling cod was selected, to exclude the effect of the fishing on the fish as completely as possible. Part of the fish was immediately put in ice water and the rest was stored for 1 1/2 hours on deck before it was bled, eviscerated and put on ice in a box. The fish that was immediately placed in ice water was also bled and eviscerated after 1 1/2 hours and put on ice in a box.

After the fish had been stored on ice for 3 days, it was measured by various methods. The fish was then filleted in a filleting machine and some of the fillets skinned in a skinning machine. Substances such as ribonucleic acids (RNA) were then measured as well as the so-called tear resistance of the fillets. This is a size measurement of fillet pieces with a special instrument, but the measurement unit is called tear resistance. Specially trained staff also assessed looseness of the fish flesh (gaping assessment).

Mynd 1a. RNA-gildi og rifþol í þorskflökum eftir árstíma.

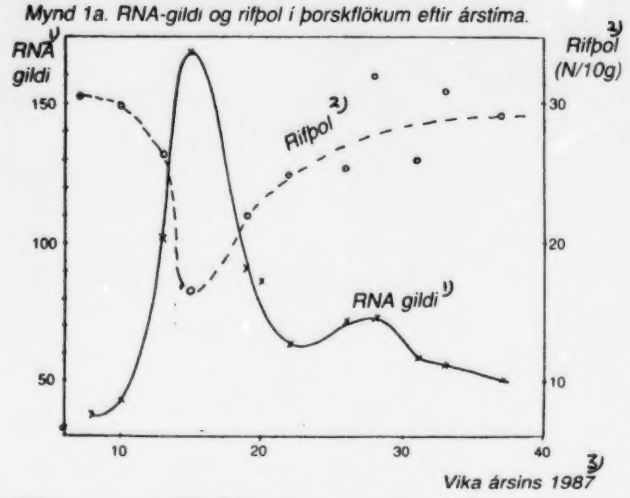
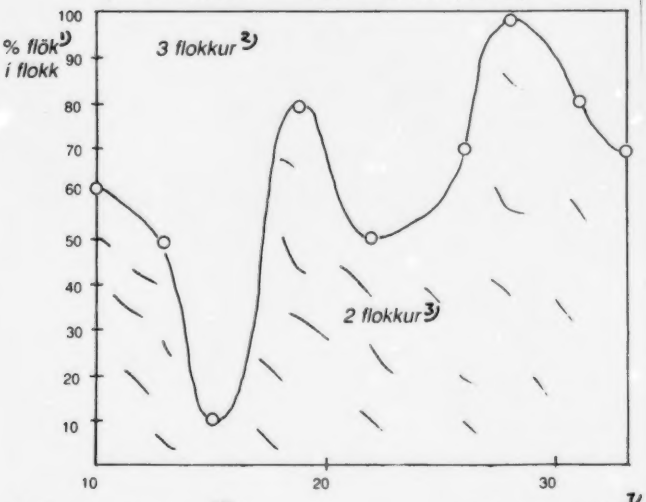


Illustration 1a. The RNA value and tear resistance of cod fillets depending on the time of the year.

Key: 1) RNA value
2) Tear resistance
3) Week of the year 1987

Mynd 1b. Gæðamat á flökum með roði (losmat).



1. flokkur – ekkert los. 4)
2. flokkur – örlítið los. 5)
3. flokkur – umtalsvert los. 6)

Illustration 1b. Quality assessment of fillets with skin (looseness assessment).

Key: 1) % of fillets in category
2) Category 3
3) Category 2
4) Category 1 - no looseness
5) Category 2 - some looseness
6) Category 3 - considerable looseness
7) Week of the year 1987

Mynd 2. Framleiðsla á blokk og marningi í frystihúsum landsins sem % af heildarþorskafurðum þ.e. sá hluti sem fer ekki í neytendapakkningu.

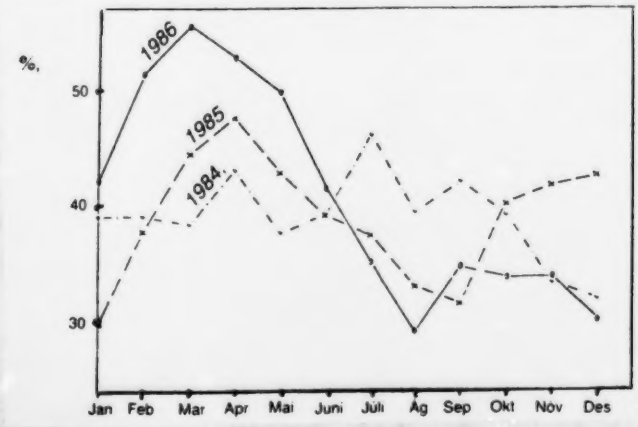


Illustration 2. Production of blocks and ground produce of the freezing plants of the country in % of the total cod produce, i.e. the part that is not destined for consumer packaging.

The most important conclusions were that the tear resistance and the gaping assessment fluctuate greatly over the year, the low point being the 15th week, i.e., about 1987-04-10 (see Ill. 1a), with the gaping assessment carried out on fillets with skin. The RNA value was highest at the same time, which would indicate that feed was most abundant as well. A looseness assessment also yielded the worst results at that time: just 10% of fillets (with skin) were assessed as belonging to category 2, while 90% belonged to category 3 (see Ill. 1b). The RNA value then dropped quickly at the same time that the gaping assessment improved. Statistical studies show that good a correlation (converse) exists between the RNA value and gaping. Tear resistance measurements are also in good agreement (R=0.798) with the gaping assessment. A looseness assessment on skinned fillets yielded very similar results, but fillets sometimes seem to loosen a great deal during skinning for unknown reasons.

Illustration 2 shows the production of blocks and ground produce of the freezing plants of the country (60 plants) over 3 years. The illustration shows the portion of the total cod production that is not destined for top-quality packaging (fillets). The main reason for the low use of consumer packaging is looseness, but there are certainly several reasons for the choice of packaging. Illustration 2 shows that the use of consumer packaging was lowest in March and April 1985 and 1986, which is the time that the RNA value was highest in 1987. It may therefore be concluded that the nutritional condition of cod is the main reason for the low use of consumer packaging in the spring and early-summer months in the southeast, but the supply of nutrition fluctuates somewhat depending on the part of the country.

The conclusions of this study are set forth in a 32-page report of the Icelandic Fisheries Laboratories entitled "Factors Affecting Gaping/Looseness of Fillets from Fresh Unfrozen Atlantic Cod (Gadus morhua)". The authors are Dr. R. Botta and Dr. Jonas Bjarnason. The conclusions are also published in foreign scientific journals.

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